North Central State College

MASTER SYLLABUS	2025-2026

A. Academic Division: Health Sciences

B. Discipline: Bioscience Technology

C. Course Number and Title: BIOS1010 Introduction to Bioscience Lab Techniques

D. Assistant Dean: Heidi Kreglow, PT

E. Credit Hours: 4
Lecture: 2 hours
Laboratory: 4 hours

F. Prerequisites: ENGL0040, MATH0084 & High School Chemistry or CHEM1010 (minimum grade of C- required for all) or qualifying placement test scores

G. Last Course/Curriculum Revision Date: Fall 2023 Origin date: 3/7/2011

H. Textbook(s) Title:

Introduction to Biotechnology
- Author(s): Thierman, W. and Palladino, Michael Pearson
- Copyright Year: 2019
- Edition: 4th
- ISBN: 9780134650197

Laboratory Manual for Biotechnology and Laboratory Science: The Basics
- Author(s): Seidman, Kraud, Brandner, Mowery.
- Copyright Year: 2011
- Edition: 1st
- ISBN #: 978-0321-64402-2

I. Workbook(s) and/or Lab Manual: None

J. Course Description: Introduction to Bioscience Lab Techniques is designed to give students an introduction to the scientific concepts and laboratory research techniques currently used in the field of biotechnology. Students develop basic laboratory skills by the examination of the various instruments and methods of analysis used in the laboratory today. It will begin with general safety procedures utilized in every lab and cover more specific issues relating to certain analytical protocol.

Critical thinking and communication skills currently used in the biotechnology industry will begin in this course and continue throughout the program. Through reading assignments, laboratory work, and workplace experiences, students will explore and evaluate career opportunities in the field of biotechnology.

K. College-Wide Learning Outcomes

College-Wide Learning Outcomes	Assessments - - How it is met & When it is met
Communication – Written	
Communication – Speech	Oral Presentation. (Week 14) Oral Communication VALUE Rubric
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	Research for oral presentation. (Week 14) Information Literacy VALUE Rubric
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
1. Define biotechnology and describe different types of biotechnology and their applications.	Lab Reports-Week 1,2 and 3; First interim exam-Week 6; Final exam
2. Evaluate the specific safety measure that need to be taken in a laboratory setting.	Lab Reports-Week 1,2 and 3; First interim exam-Week 6; Final exam
3. Demonstrate proper measuring techniques of various laboratory materials.	Lab Reports-Week 1,2 and 3; First interim exam-Week 6; Final exam
4. Synthesize the structure, replication and variation of DNA.	Lab Reports-Week 4, and 5; First interim exam-Week 6; Final exam
5. Demonstrate accurate biological solutions preparation.	Lab Reports-Week 4, and 5; First interim exam-Week 6; Final exam
6. Define recombinant DNA technology and explain how it is used to clone genes and manipulate DNA.	Lab Reports-Week 6 and 7; Second interim exam-Week 12; Final exam
7. Explain the use of some biotechnologically produced enzymes in industry.	Lab Reports-Week 8; Second interim exam-Week 12; Final exam
8. Describe features of bacteria that make then useful for applications in biotechnology.	Lab Reports-Week 9 and 10; Second interim exam-Week 12; Final exam
9. Define DNA fingerprinting and explain how it can be used in forensic science.	Lab Reports-Week 11 and 12; Second interim exam-Week 12; Final exam
10. Describe different molecular techniques for detecting chromosomal abnormalities and for genetic testing.	Lab Reports-Week 13; Final exam
11. Describe the role of important federal agencies in regulating biotechnology products.	Lab Reports-Week 14; Final exam
12. Define bioethics and explain how it relates to biotechnology.	Final exam

M. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70-72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63-66	D	1.00	Below Average
60-62	D-	0.67	Poor
00-59	F	0.00	Failure

N. College Procedures/Policies:

North Central State College believes that every student is a valued and equal member of the community.* Every student brings different experiences to the College, and all are important in enriching academic life and developing greater understanding and appreciation of one another. Therefore, NC State College creates an inclusive culture in which students feel comfortable sharing their experiences. Discrimination and prejudice have no place on the campus, and the College takes any complaint in this regard seriously. Students encountering aspects of the instruction that result in barriers to their sense of being included and respected should contact the instructor, assistant dean, or dean without fear of reprisal.

* *Inclusive of race, color, religion, gender, gender identity or expression, national origin (ancestry), military status (past, present or future), disability, age (40 years or older), status as a parent during pregnancy and immediately after the birth of a child, status as a parent of a young child, status as a foster parent, genetic information, or sexual orientation*

Important information regarding College Procedures and Policies can be found on the syllabus supplement located at

https://ncstatecollege.edu/documents/President/PoliciesProcedures/PolicyManual/Final%20PDFs/14-081b.pdf

North Central State College

SYLLABUS ADDENDUM

Academic Division:	Bioscience	**Discipline:**	Biology
Course Coordinator:	Tony Miller, PhD		
Course Number:	BIOS 1010-910	**Course Title:**	Intro to Bioscience Lab Techniques
Semester / Session:	Fall 2025	**Start / End Date:**	08/11/2025 thru 12/12/2025

Instructor Information

Name:	Tony Miller	**Credentials:**	PhD, Ecology & Evolutionary Biology
Phone Number:	419-755-4548	**E-Mail Address:**	jmiller2@ncstatecollege.edu
Office Location:	HS-330	**Office Hours:**	M: 8-9AM, 2:50-3:50PM; TH: 8-11AM

I. Topical Timeline / Course Calendar (Subject to Change):

Weeks	Lecture Topics	Lecture Assignments (Due Date)	Lab Topics (Due Date)
1	Course introduction		Lab Tour, Working Safely with Lab Chemicals (8/21)
2	Biotech & Workforce (Chapter 1)	Week 2 Gateway Quiz (8/19)	Documentation, Recording Measurements (8/28)
3	Intro to Genes & Genomes (Chapter 2)	Week 3 Gateway Quiz (8/26) Week 2 Module Quiz (8/26)	Micropipettes, Pipettes, Graduated Cylinders (9/4)
4	Recombinant DNA Tech & Genomics I (Chapter 3)	Week 4 Gateway Quiz (9/2) Week 3 Module Quiz (9/2)	Spectrophotometry (9/11)
5	Recombinant DNA Tech & Genomics II (Chapter 3)	Week 5 Gateway Quiz (9/9) Week 4 Module Quiz (9/9)	Solution Prep Calculations, Buffer Solution Prep (9/18)
6	Exam 1 Review	Week 5 Module Quiz (9/16) Advising Assignment (9/16)	**Lecture Exam I on 9/18** Lab Practical I Review
7	Proteins as Products (Chapter 4)	Week 7 Gateway Quiz (9/23)	**Lab Practical I on 9/25** Bradford Protein Assay I
8	Microbial Biotechnology I (Chapter 5)	Week 8 Gateway Quiz (9/30) Week 7 Module Quiz (9/30)	Bradford Protein Assay II (10/16)
FALL BREAK (10/6-10/10): NO CLASSES			
9	Microbial Biotechnology II (Chapter 5)	Week 8 Module Quiz (10/14)	Bacterial Isolation, Gram Stain (10/23)
10	Medical Biotechnology I (Chapter 11)	Week 10 Gateway Quiz (10/21)	Electrophoresis Introduction, COVID Diagnostics (10/30)
11	Medical Biotechnology II (Chapter 11)	Week 11 Gateway Quiz (10/28) Week 10 Module Quiz (10/28)	Forensics Enzymology (11/6)
12	Exam II Review	Week 11 Module Quiz (11/4)	**Lecture Exam II** DNA Fingerprinting I
13	**NO LECTURE (VETERAN'S DAY)**		DNA Fingerprinting II Ethics Discussion (11/20)
14	DNA Fingerprinting & Forensics (Chapter 8)	Week 14 Gateway Quiz (11/18)	**Lab Practical II**
15	Bioremediation, Biotechnology Regulations (Chapters 9, 12)	Week 14 Module Quiz (11/25)	**NO LAB (THANKSGIVING)**
16	Oral Presentations	Presentations due by 12/1	Bioremediation Lab Final Exam Review
17	**NO LECTURE MEETING**	**Lecture Final Exam during lab hours: CUMULATIVE**	

II. Grading and Testing Guidelines (Subject to Change**):

Final Grade Calculation

Activity	Qty	Points	Percentage
Advising Assignment	1	5	~0.5
Lecture Attendance (5 pts per session) (One Absence Allowed)	14	70	~6%
Lab Attendance (5 pts per session)	11	55	~5%
Gateway Quizzes (5 pts each)	9	45	~4%
Module Quizzes (20 pts each)	9	180	~16%
Lecture Exams (100 pts each)	2	200	~18%
Lab Practical Exams (100 pts each)	2	200	~18%
Final Exam (Lecture Only)	1	100	~9%
Post-Lab Assignments (20 pts each)	10	200	~18%
Oral Presentation	1	50	~4%

1. **Attendance**
    a. 11 Labs (And 5 In-person exams during lab time)
    b. 15 Lecture sessions
2. **Quizzes**
    a. Gateway (Reading) Quizzes
    b. Module Quizzes
3. **Tests (in-person during Lab Hours)**
    a. Lecture Exams Weeks 6 & 12
    b. Lab Practical Exams Weeks 7 & 14
    c. Cumulative lecture final exam (Week 17)
4. **Weekly lab assignments**
5. **Oral Presentations**

**Extra credit may also be assigned (amounting to no more than 25 points in the semester)

III. Examination Policy:

Exams will be conducted during lab hours and will consist of multiple choice and essay questions. On lecture exam days, students should bring an electronic device, as exams will be conducted on Canvas. On lab practical days, students should bring a pencil, and they can use their lab notebooks.

1. The reasons for which a student will be excused from taking an examination
    a. Hospitalization (with documented verification)
    b. Death in the immediate family (with documented verification)
    c. Personal illness or illness in immediate family - (doctor's excuse required).
2. A student who misses an examination for any reason is responsible for making up the exam within a week of returning from class (Exceptions can be made under extraordinary circumstances).
3. No makeup opportunity will be given for absences related to quizzes.
    a. Since quizzes are conducted on Canvas, they can be taken from anywhere with access to Canvas.
    b. Makeups are NOT permitted. Be sure to take the quiz within the quiz window.

IV. Class Attendance and Homework Make-Up Policy:

The instructor needs to be notified as soon as possible if a student needs to miss class/lab or will be unable to turn in an assignment on time. Due to the nature of some of the planned experiments, make-up labs may be impossible to accomplish. Exceptions (such as illness, family emergency, etc.) can be made on a case-by-case basis. *It is the responsibility of the student to get with the instructor to make-up homework and laboratory assignments*. It is at the instructor's discretion if late assignments without a valid excuse will be graded.

One absence is allowed for the online lecture without losing any lecture attendance points. Due to the nature of lab, as described above, there is no allowance for missed lab attendance points.

V. Classroom Expectations:

Students are expected to stay current with the online lecture material and come prepared to discuss the lab and lecture material. In addition, they are to be respectful of each other and treat one another fairly, both inside and outside of scheduled meeting times. During lab meetings, cell phones are to be on silent and put away due to common laboratory safety practices. Failure to do so may result in the student being asked to leave and will not be counted as present for that day.